

AD-A175 941

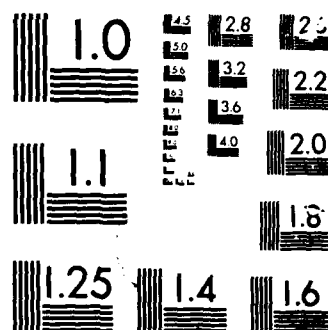
VISUAL CORTICAL UNIT RESPONSE PROPERTIES IN KITTENS
GIVEN BRIEF MONOCULAR (U) BROWN UNIV PROVIDENCE RI
CENTER FOR NEURAL SCIENCE A B SAUL 10 DEC 86 TR-34
N00014-81-K-0041 F/G 6/3

1/1

UNCLASSIFIED

NL





12

AD-A175 941

DTIC FILE COPY

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER #34	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Visual Cortical Unit Response Properties in Kittens given brief Monocular Experience Following Dark Rearing.		5. TYPE OF REPORT & PERIOD COVERED TECHNICAL REPORT
AUTHOR(s) A. B. SAUL		6. PERFORMING ORG. REPORT NUMBER
PERFORMING ORGANIZATION NAME AND ADDRESS CENTER FOR NEURAL SCIENCE BROWN UNIVERSITY PROVIDENCE, RHODE ISLAND 02912		8. CONTRACT OR GRANT NUMBER(s) N00014-81-K-0041
CONTROLLING OFFICE NAME AND ADDRESS PERSONNEL AND TRAINING RSCH. PROGRAM OFFICE OF NAVAL RESEARCH, Code 442PT ARLINGTON, VIRGINIA, 22217		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS N-201-484
MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE December 10, 1986
		13. NUMBER OF PAGES 2 Pages
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited. Publication in part or in whole is permitted for any purpose of the United States Government.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES The following is an abstract of a Ph.D. Thesis sub-itted to the Department of Applied Mathematics, Brown University, May, 1986. The manuscript is available in full.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Ocular Dominance Orientation Selectivity Dark-rearing Visual Cortex Neural Systems		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Single unit recordings were obtained from 300 cells in area 17 of 20 kittens. The subjects were reared in the dark from about 2 until 6 weeks of age. Immediately prior to recording, brief periods of visual experience were allowed with one eyelid closed. Kittens were tested after 0,1,2, or 7 days of monocular experience. Responses to light bars moving in each of 12 directions presented to each eye were analyzed to provide quantitative indices of ocular dominance, orientation selectivity, and reliability for each cell.		

DTIC ELECTED
DEC 19 1986
E

Ocular dominance shifted toward the open eye with as little as 6 hours of monocular experience. Similarly, reliability and selectivity in the experienced eye improved rapidly. These variables appeared to saturate quickly however: reliability did not improve significantly between 1 and 2 days. Selectivity continued to increase during the second day, although at a slower rate, leading to a slightly later saturation. No major changes were obvious in the deprived eye.

The results suggest that visual experience following dark rearing leads to a rapid improvement in evoked responsiveness, reversing the degradative effects of the deprivation.

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



**Visual Cortical Unit Response Properties in Kittens given brief Monocular
Experience following Dark Rearing**

Alan B. Saul

Department of Applied Mathematics
and
Center for Neural Science,
Brown University

Key Words: selectivity, ocular dominance, visual cortex, dark-rearing, neural systems

Supported by ONR contract N00014-81-K-0136
Full copy of manuscript is available.

1 Abstract of "Visual Cortical Unit Response Properties in Kittens given brief Monocular Experience following Dark Rearing" by Alan Bruce Saul, Ph.D., Brown University, May 1986.

Single unit recordings were obtained from 300 cells in area 17 of 20 kittens. The subjects were reared in the dark from about 2 until 6 weeks of age. Immediately prior to recording, brief periods of visual experience were allowed with one eyelid closed. Kittens were tested after 0, 1, 2, or 7 days of monocular experience. Responses to light bars moving in each of 12 directions presented to each eye were analyzed to provide quantitative indices of ocular dominance, orientation selectivity, and reliability for each cell.

Ocular dominance shifted toward the open eye with as little as 6 hours of monocular experience. Similarly, reliability and selectivity in the experienced eye improved rapidly. These variables appeared to saturate quickly however: reliability did not improve significantly between 1 and 2 days. Selectivity continued to increase during the second day, although at a slower rate, leading to a slightly later saturation. No major changes were obvious in the

deprived eye.

The results suggest that visual experience following dark rearing leads to a rapid improvement in evoked responsiveness, reversing the degradative effects of the deprivation.

END

2-87

DTIC